

### **REMARKS**

In the Action, claims 1-19 are rejected under 35 U.S.C. § 102(b) as being anticipated by EP 398,724 to Hughes et al. In response, claims 2, 4, 6, 8, 10, 12, 15, and 18 are cancelled, claim 13 is amended and new claims 20 and 21 are added. The pending claims in this application are claims 1, 3, 5, 7, 9, 11, 13, 14, 16, 17 and 19-21, with claims 1 and 13 being independent. A Declaration Under 37 C.F.R. § 1.132 is attached and is discussed hereinafter in connection with the claim rejections under 35 U.S.C. § 102(b).

Claim 13 is amended to define the polymer as having a clay dispersibility of not less than 0.47 in high-hardness water. The clay dispersibility of the polymer obtained according to the invention is disclosed in the Examples, and particularly Examples 1-4 and 1-6 and Table 1 on page 48. The process for determining the clay dispersibility in high-hardness water is disclosed on page 36, line 13 to page 37, line 12 of the specification. Accordingly, the amendment to claim 13 is supported by the specification. As discussed in greater detail herein, the art of record does not disclose or suggest this feature. Furthermore, this feature is not inherent in the polymers of the art of record.

New claim 20 is added to depend from claim 1 and new claim 21 is added to depend from product claim 13. These claims recite that not less than 70 weight % of the entire amount of the monomer components (a) and (b) are added in a drop-wise manner to the reaction system. Support for claims 20 and 21 are found on page 12, lines 18-27 of the specification as originally filed. As disclosed on page 13, lines 8-11 the drop-wise addition of the monomer components provides improved calcium ion scavengeability, clay dispersibility in high-hardness water, and scale inhibition. This aspect of the invention is not disclosed or suggested in the art of record.

In view of these amendments and the following comments, reconsideration and allowance are requested.

### **Rejection Of Claims 1-19**

In the action, claims 1-19 are rejected under 35 USC 102(b) as being anticipated by EP 396,724 to Hughes et al ("Hughes"). Hughes is cited for disclosing a process for preparing a water soluble copolymer from a dicarboxylic acid and a monocarboxylic acid in the presence of a metal salt activator.

Hughes does not disclose the claimed process for producing a (meth)acrylic acid based polymer of the present invention as recited in claim 1. Specifically, Hughes fails to disclose or suggest the claimed process step of completing the drop-wise addition of the hydrogen peroxide at least 10 minutes earlier than the drop-wise addition of the mono-unsaturated mono-carboxylic acid monomer component or the step of adding the monomer component where the monomer component comprises 100 to 95 mol % of a monoethylenically unsaturated monocarboxylic acid as in claim 1.

Page 4 lines 8-10 of Hughes disclose that the monomers, initiator and neutralizer are added at a substantially uniform rate. Each of the Examples of Hughes discloses the completion of the initiator at the same time. Page 4, lines 37-41 of Hughes disclose the simultaneous addition of the monomers, which can be followed by a finishing polymerization step to reduce the amount of the unpolymerized slower reacting monomers in the final resin. The finishing polymerization step can be a post addition of the faster reacting monomers. There is no suggestion of the claimed step of completing the addition of the hydrogen peroxide at the latest 10 earlier than the completion of the addition of the monomer component as claimed.

As disclosed in the specification, the drop-wise addition of the hydrogen peroxide according to the claimed invention produces the desired low molecular weight polymers. The addition of the hydrogen peroxide later than the addition of the monomer components prevents the chain-transfer reaction, which results in a high molecular weight polymer from the initial stage of the reaction. See, for example, page 15, lines 23-28 of the specification. There is no suggestion of adding of the drop-wise addition of the hydrogen peroxide and completing the drop-wise addition of the hydrogen peroxide at the latest 10 minutes earlier than the completion of the drop-wise addition of the monomer components as in claim 1 so that claim 1 is not anticipated by Hughes.

Hughes also fails to disclose a monomer component comprising 100-95 mol % of a monoethylenically unsaturated monocarboxylic acid monomer as in claims 1 and 13. Acrylic acid is an example of a monoethylenically unsaturated monocarboxylic acid in accordance with the present invention. Hughes discloses the monomer component as containing an unsaturated carboxyl-free monomer either alone or in combination with the monocarboxylic acid component. See, for example, page 4, lines 49-55 of Hughes. As disclosed on page 5, lines 7-9 of Hughes, the concentration of the carboxyl-free monomer is up to 80% by weight and typically up to 35% by weight based on the weight of the monomer component. Thus, the monomer component of Hughes is not 100-95 mol % of a monoethylenically unsaturated monocarboxylic acid as claimed. The monomer component of Hughes of 35% to 97% by weight is not entirely the claimed monoethylenically unsaturated monocarboxylic acid having 3-6 carbon atoms, but rather a mixture of "typically" 35% by weight of the carboxyl-free monomer or entirely the carboxyl-free monomer.

Hughes discloses the use of a dicarboxylic acid such as maleic acid, which is not a monoethylenically unsaturated monocarboxylic acid as claimed. The examples of Hughes

disclose only the combination of acrylic acid and the carboxyl-free monomer, such as maleic anhydride. Moreover, the examples of Hughes do not disclose a monomer component of 100-95 mol % of acrylic acid or other monoethylenically unsaturated monocarboxylic acid. The amount of the acrylic acid in the examples of Hughes is at best 75.8% mol % in Example 6. Therefore, Hughes does not provide an example and there is no disclosure of the claimed monomer component of claims 1 and 13.

Claim 13 as amended recites the clay dispersibility in high-hardness water of not less than 0.47. Hughes does not disclose or suggest this feature. Moreover, the polymers of Hughes do not have the claimed clay dispersibility. As disclosed on page 49, lines 6-14 of the specification, the polymers of the invention are low molecular weight and have good dispersibility.

Appended hereto is a Declaration by one of the inventors, Shigeru Yamaguchi, presenting the test data of the polymers produced according to the process disclosed in Hughes. As shown in the test data, the completion of the drop-wise addition of the hydrogen peroxide is either at the same time of the completion of the monomer or 60 minutes later than the completion of the addition of the monomer. The clay dispersibility in high-hardness water of the polymers of Hughes is lower than the clay dispersibility of the low molecular weight polymers of the claimed invention. Thus, the polymers of Hughes are not the same as the polymers of claim 13 and are not made by the process of claims 1 and 13.

Hughes also does not disclose the claimed Hazen value of the polymer as recited in claim 13. For the reasons noted above, the polymers of Hughes are not made by the same process, and thus, do not have the same properties. Therefore, the claimed Hazen value is not inherent in the polymers of Hughes so that claim 13 is not anticipated.

The features of claims 3, 5, 7, 9, 14, 16, 17 and 19-21 are also not disclosed or suggested in Hughes either alone or in combination with the features of claims 1 and 13 so that these claims are not anticipated. Hughes does not disclose the molecular weight of claim 3, the final concentration of the polymer of claim 5 the dispersion degree of claim 7, the ratio of the persulfate salt and the hydrogen peroxide of claim 9 or the low molecular weight polymer of claim 11 in combination with the process of claim 1. Hughes also fails to disclose the detergent composition of claim 14 and claim 16, the water treating agent of claim 17 and claim 19 in combination with the features of claims 11 or 13. As noted above, Hughes also fails to disclose the step of adding not less than 70 weight % of the monomer component by a substantially drop-wise addition as in claims 20 and 21 in combination with the process steps of claims 1 and 13.

In view of these amendments and the above comments, reconsideration and allowance are requested.

Respectfully submitted,



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